

REMARKS

Claims 1-5, 7-8 and 22-26 were examined. Claims 1-5, 7-8 and 22-23 are rejected. Claims 24-26 are objected to as allowable if rewritten in independent form. Applicants amend claims 1 and 24-26 to be in allowable form as suggested by the Patent Office. Hence, Applicant respectfully requests reconsideration of claims 1-5, 7-8 and 22-23 in view of at least the following remarks.

I. Claims Rejected Under 35 U.S.C. § 102

Claims 1-2 and 7-8 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,413,962 issued to Lur et al. ("Lur"). It is axiomatic that to be anticipated, every limitation of a claim must be disclosed in a single reference.

Applicant respectfully disagrees with the rejection above for at least the reason Lur does not disclose the first material has a property that inhibits electromigration of the second material into the second or third layer, as required by claim 1.

Lur discloses air dielectric 85 between envelope oxide layer 42 and passivation layer 80 (see Figure 11 and column 4 lines 23-34), where stud 29 is coated with oxide layer 42. Lur teaches that thin envelope oxide 42 surrounds all the electrode metal and inter-level metal studs 29 so that when inter-level dielectric layer 34 is etched using a solution with high etch selectivity for nitride (e.g., layer 34) to oxide (e.g., layer 42), a coating of thin envelope oxide (e.g., layer 42) is left protecting and covering the metal studs (e.g., studs 29) (see column 3 lines 57-68). Lur also teaches that metal layer 40 or 50, such as aluminum, aluminum alloy, tungsten, copper, or silver may be electrodes formed on contact studs 26 and 29, such that the combination of the electrode and stud is coated with envelope oxide layer 42 (see column 2 lines 41-63, column 3 lines 8-59, column 4 lines 15-21, and figure 11). Thus, layer 40 and 50 can not protect against electromigration as required by claim 1 because oxide envelope 42 allows such migration by being between studs 29 and adjacent dielectric layers and because metal layer 400 and 50 cause electromigration.

As noted in the **Response to Arguments** Section of the current Office Action, the Patent Office appears to agree that Lur does not teach protection against

electromigration as required by claim 1, although the Examiner believes it would still have a property that inhibits diffusion. Applicant has amended claim 1 to require a property that inhibits electromigration. Consequently, the Patent Office has not identified and Applicant is unable to find any disclosure in Lur of the above noted limitation of claim 1. Hence, for at least this first reason, Applicant respectfully requests the Patent Office withdraw the rejection above.

Any dependent claims not mentioned above are submitted as not being anticipated or obvious for at least the same reasons given above in support of their base claims.

II. Claims Rejected Under 35 U.S.C. § 103(a)

Claims 3-5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,413,962 issued to Lur et al. ("Lur") in view of U.S. Patent No. 6,696,758 issued to Dubin et al. ("Dubin"). To render a claim obvious, all elements of the claim must be taught or suggested by at least one properly combined reference.

Applicant respectfully disagrees with the rejection above for at least the reason Lur and Dubin do not teach or suggest a shunt comprising a first material different from a second material of the interconnects covering the top of the interconnect, wherein the first material has a property that inhibits electromigration of the material of the interconnects into another layer, as required by claim 1.

As noted above, Lur does not teach or suggest the above noted limitation of claim 1.

Moreover, Dubin fails to cure the shortcomings of Lur. Specifically, Dubin discloses a substrate comprising a device having a contact point, a dielectric layer overlying the device with an opening to the contact point, and an interconnect structure disposed in the opening including an interconnect material and a different conductive shunt material (see Abstract). Dubin teaches shunt material 380A substantially filling via 370, and barrier material 340 along sidewalls and base of trench 375 (see column 9 lines 12-16 and Figure 8). However, the Patent Office has not identified and Applicant

is unable to find any teaching or suggestion in Dubin of the above noted limitation of claim 1.

Hence, for at least the reasons above, Applicant respectfully requests the Patent Office withdraw the rejection above of claims 3-5 (e.g., as claims 3-5 depend from allowable base claim 1).

Claims 22-23 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lur.

Applicant respectfully disagrees with the rejection above for at least the reason that Lur does not teach or suggest a shunt comprising a first material different from a second material of the interconnects covering the top of the interconnect, wherein the first material has a property that inhibits electromigration of the material of the interconnects into another layer, as required by claim 1.

As noted above, Lur does not teach or suggest the above noted limitation of claim 1. Hence, for at least the reasons above, Applicant respectfully requests that the Patent Office withdraw the rejection above for claims 22-23, e.g. as claims 22-23 depend from allowable base claim 1.

III. Allowable Subject Matter

Applicants note with appreciation that the Patent Office has indicated claims 24-26 are objected to but allowable if rewritten in independent form, and the reasons for allowability of those claims. Applicants have amended claims 24-26 to be in independent form including the limitations identified by the Patent Office as making those claims allowable. Hence, Applicants respectfully request allowance of claims 24-26.

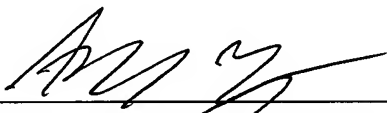
CONCLUSION

In view of the foregoing, it is believed that all claims now are now in condition for allowance and such action is earnestly solicited at the earliest possible date. If there are any additional fees due in connection with the filing of this response, please charge those fees to our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

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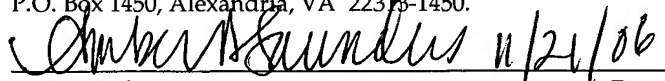


Angelo J. Gaz, Reg. No. 45,907

12400 Wilshire Blvd.
Seventh Floor
Los Angeles, California 90025
(310) 207-3800

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Amber D. Saunders Date